IOWA HIGHWAY RESEARCH BOARD (IHRB)

Minutes of May 21, 2010

Regular Board Members Present

A. Abu-Hawash
D. Ahart
J. Berger
V. Dumdei
R. Knoche
J. Moellering
M. Nahra
C. Schloz
J. Waddingham
W. Weiss

Alternate Board Members Present

W. Zitterich for J. Adam
J. May for J. Joiner

Members With No Representation

J. Alleman
K. Hornbuckle
B. Moore

Alternates Present as Guests

K. Nicholson
R. Younie

Secretary - M. Dunn

Visitors

Lisa Rold	Federal Highway Administration
Max Grogg	Federal Highway Administration
Edward Engle	Iowa Department of Transportation
Sandra Larson	Iowa Department of Transportation
Mike Nop	Iowa Department of Transportation
Salam Rahmatalla	The University of Iowa

The meeting was held at the Iowa Department of Transportation Ames Complex, Materials East/West Conference Room, on Friday, May 21, 2010. The meeting was called to order at 9 a.m. by Chairperson Jay Waddingham with an initial number of 10 voting members/alternates at the table.

Agenda

No changes were made to the Agenda.

Motion to approve minutes from the April 30, 2010, meeting by J. Berger. 2nd by R. Knoche.
Motion carried with 10 aye, 0 nay, 0 abstaining.

Two Members Joined the Table

FINAL REPORT TR-501, "Optimization and Management of Materials in Earthwork Construction,"
Vern Schaefer, Iowa State University ($175,000)

BACKGROUND
As a result of forensic investigation of problems in materials earthwork construction methods across Iowa, this research study was developed to provide solutions to identified problems through better management, optimization of available pavement geotechnical materials and ground improvement, soil reinforcement, and other soil treatment techniques. The overall goal was achieved through simple laboratory experiments such as particle size analysis, plasticity tests, compaction tests, permeability tests, and strength tests.

OBJECTIVES
- Evaluate the engineering properties of embankment materials by mixing different soils, such as the select and unsuitable soils in different proportions.
- Evaluate the permeability of mixed materials.
- Evaluate the use of flowable mortar in place of conventional backfill material around a drainage pipe.

BENEFITS
An improved model of saturated hydraulic conductivity was created for use with glacial soils from Iowa. The use of proper trench backfill compaction or flowable mortar will reduce the potential for developing a bump above culverts.

Q: When mixing selections of unsuitable soils in the lab, how was effectiveness for field mixes anticipated?
A: Various types of mixtures are available and are an added expense, so on a project-by-project basis, the cost of doing the mixing would need to be considered compared with bringing in select materials from outside. It depends on site layering of unsuitable and select soils; if these soils are close to one another, you might be able to do the mixing as they're excavated. This process would be project-specific.

C: During a project a few years ago when replacing culverts across the road in advance of a resurfacing project, I used a 100% granular fill right up to where the pavement would have been. There was a freeze-thaw cycle before the new pavement was placed on top. What I observed was that after about three-to-four years, the granular material of the culvert stayed in place, but the other soils expanded during the winter. The problem still occurred in spite of our best efforts.
A: During Phase II of the Utility Cut project we found in that instance bringing the granular material up to about two feet below the surface and having the last plug of the soil match the native soil helps with freeze-thaw effects. A granular fill acts as a very stiff component that probably won't move, but the other soils next to it can move a little, so you need to try and match that.

Q: New standards incorporate a water compaction method. Did you check on that?
A: That is part of the Utility Cut project.

Q: How do you measure whether or not the mix is adequate in the field?
A: In the field on a pilot project, one would take samples and look at how well they are mixed visually, then, do a grain size analysis and find the particle size distribution.

Motion to Approve by V. Dundei. 2nd by W. Weiss.
Motion carried with 12 aye, 0 nay, 0 abstaining.

PROPOSAL, "Update of RCB Culvert Standards to LRFD Specifications," Stuart Nielsen, Iowa DOT ($338,032)

BACKGROUND
The Iowa Department of Transportation (Iowa DOT) desires to utilize consulting engineering services to bring the current reinforced concrete box (RCB) culvert standards into conformance with the American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor (LRFD) Bridge Design Specifications, 2007 Edition (including 2008 and 2009 interims). This project is subdivided to five (5) parts as defined in *Proposal to Update CIP Reinforced Concrete Box Culverts to LRFD* by Mike Nop, Iowa DOT.

OBJECTIVES
Update RCB culvert standards and designs for single, twin and triple barrel culverts of various sizes and various fill heights, flared wing headwall designs for each barrel configuration, and outlet flume designs for various barrel heights. Details for bell joints, flume basins, baffles, and culvert extensions will also be included with the RCB culvert standards.

BENEFITS
The Iowa DOT will obtain updated RCB culvert standards. The proposed software is a Windows application developed using Microsoft Visual Basic program language and tools. This approach will provide the end user with an application that can be readily installed and run on a common desktop computer or over a network, will not require additional software to run other than Microsoft Windows and will have a simple and intuitive user interface.

Q: What's the reason for adding the 6'x7'?
A: I don't know how often we use it, however, it's very easy to do. When we developed the software it was evident we could run through every different size easily; the sheets will be set up so we thought we'd include them. It's worthwhile having the software and doing all the sizes at the same time.

Q: Are precast culverts done by LRFD?
A: Precast culverts are done by boxcar design and will be updated to LRFD this year. This is typically handled by industry. We give them criteria, for example, and ask for updates to LRFD; they do a self-analysis. I can check into that further.

Q: How did we request this proposal?
A: Our office identified a need and through a competitive pre-selection process, sent out an invitation to a qualified consultant based on work they have done in the past. This is very competitive; the bulk of cost is for the development of the software.
C: Compared with what we paid for metrication of standards a few years back, this is a very good price. This will blend with our straight headwall projects.

C: The consultant is developing the software, but we will own the software and make it available free of charge to anyone who wants to use it. We're hoping to put it on the website so consultants and counties can use it.

Q: In changes to LRFD, are you expecting more steel and concrete? Which way do you think it will go?
A: In my experience, all of the LRFD loads seem slightly heavier; there's more steel and thicker concrete in our structures, so they can take heavier loads.
C: Not dramatically different. We're really trying to stay in the same parameters in terms of sizes; we don't want contractors to need to ramp up to new standards.

Q: How will this be funded?
A: As a standard split.
C: Someone may question why we're doing standard updates through research, but these have been funded this was going back to the 1980s.
Q: Is this sole sourcing?
Mark: This is not sole sourcing. The way we've typically handled engineering-type study projects in the past if a consultant is involved is to go through our consultant sections and have them select a company based on an approved process, just as they would on any other project.

The way we process Board RFPs is governed by different guidelines because we send RFPs out to state universities, allowing for use of a less rigorous process. However, if we have a project requiring consultant involvement, we ask offices that deal with consultant selections to handle those. Every few years an invitation to participate in a state-wide contract that allows Iowa DOT to use a consultant for a one-to-three year period (based on that selection) is sent out.

C: Foth Infrastructure & Environment, LLC, was selected through a RFP selection process. Stanley did the slab bridges; WHKS did the beam bridges. These are really the last standards we need to be brought up to LRFD standards.

Motion to Approve by M. Nahra. 2nd by C. Schloz.
Motion carried with 12 aye, 0 nay, 0 abstaining.

NEW BUSINESS

UPDATE on Non-IHRB Research Activities, Iowa DOT Research and Technology Bureau
Updates on Iowa DOT research activities unrelated to the Board were presented by: Mark Dunn, P.E., Executive Secretary to the Iowa Highway Research Board and Iowa DOT Operations Research Engineer; Edward Engle, P.E., Iowa DOT Secondary Roads Coordinator; and Mary Starr, Iowa DOT Iowa Highway Research Board Secretary.

ADJOURN
Motion to Adjourn by J. Berger. 2nd by M. Nahra.
Motion carried with 15 aye, 0 nay, 0 abstaining.

The next meeting of the Iowa Highway Research Board will be held on Friday, May 21, 2010, in the East/West Materials Conference Room at the Iowa DOT.

_____
Mark J. Dunn, IHRB Secretary